

AMENDMENT TRANSMITTAL LETTER (Large Entity) Applicant(s): Wei Pan, Jer-shen Maa, David Evans and Sheng Teng Hsu				Docket No. SLA0493	
Serial No 09/820,068	Filing Date March 28, 2001	Examiner Michael K. Luhrs	Group Art Unit 2824		
Invention: Method of Barrier Metal Surface Treatment Prior to Cu Deposition to Improve Adhesion and Trench Filling Characteristics					
TO THE COMMISSIONER FOR PATENTS					
Transmitted herewith is an amendment in the above identified application. The fee has been calculated and is transmitted as shown below.					
CLAIMS AS AMENDED					
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST # PREV. PAID FOR	NUMBER OF EXTRA CLAIMS PRESENT	RATE	ADDITIONAL FEE
TOTAL CLAIMS	13 -	20 =	0	x \$15.00	\$0.00
INDEP. CLAIMS	3 -	3 =	0	x \$24.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					\$0.00

APR 17 2003
 TECHNOLOGY CENTER 2800

☒ No additional fee is required for amendment.
☐ Please charge Deposit Account No. 19-1457 in the amount of \$0.00.
 A duplicate copy of this sheet is enclosed.
☐ A check in the amount of _____ to cover the filing fee is enclosed.
☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 19-1457.
 A duplicate copy of this sheet is enclosed.
☒ Any additional fees required under 37 C.F.R. 1.16.
☒ Any patent application processing fees under 37 C.F.R. 1.17.

David C. Ripma, Reg. No. 27,672

Dated: APRIL 17, 2003

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office under 37 C.F.R. §1.8 at Fax No. (703) 872-9318 on April 17, 2003.

David C. Ripma, Reg. No. 27,672

Note: Each paper must have its own certificate or transmission, or this certificate must identify each submitted paper. The papers submitted include:

<input checked="" type="checkbox"/> This Amendment Transmittal Letter (Duplicate Attached)	2 page(s)
<input checked="" type="checkbox"/> Response under 37 CFR § 1.111	13 pag ()
<input checked="" type="checkbox"/> Attachments	2 pag (s)
<input checked="" type="checkbox"/> Petition for Extension of Time under 37 C.F.R. § 1.136	pag

Total pages, including this Transmittal: 17

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	PATENT APPLICATION
)	
Inventors: Wei Pan, Jer-shen Maa,)	April 17, 2003
David R. Evans and)	
Sheng Teng Hsu)	
)	Attorney Docket No.
Serial No.: 09/820,068)	SLA0493
)	
Filed: March 28, 2001)	
)	Group Art Unit 2824
Title: METHOD OF BARRIER)	
METAL SURFACE)	Examiner: Luhrs, M.
TREATMENT PRIOR)	
TO Cu DEPOSITION)	
TO IMPROVE ADHESION)	
AND TRENCH FILLING)	
CHARACTERISTICS)	

RESPONSE UNDER 37 C.F.R. § 1.111

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Hon. Commissioner for Patents
Washington, D.C. 20231

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Sir:

In response to the Office Action dated December 17, 2002, Applicants
submit the following response:

Please amend the application as follows:

In the Claims:

Please amend claims 1 and 21. A clean copy of the amended claims is
shown on the following sheet(s), and a marked-up version, showing the changes
made, is being submitted as Appendix A to this Amendment, pursuant to the
amendment practice as specified in 37 C.F.R. section 1.121. A clean copy of the
full set of pending claims is being submitted as Appendix B to this Amendment.

CLEAN COPY OF THE CLAIMS

1. (Twice Amended) A method of pre-treating a barrier metal layer of a partially finished integrated circuit device prior to the deposition of a copper film thereon, comprising the steps of:

providing a partially finished integrated circuit device including a barrier metal layer;

subjecting said barrier metal layer to a non-plasma atmosphere chosen from the group consisting of: an ambient vacuum, hydrogen gas, argon gas and helium gas;

subjecting said barrier metal layer to a temperature greater than 200 degrees Celsius for at least thirty seconds to form a pre-treated barrier metal layer; and

depositing a copper film on said pre-treated barrier metal layer.

21. (First Amended) A method of pre-treating a barrier metal layer of a partially finished integrated circuit device prior to the deposition of a copper film thereon, comprising the steps of:

providing a partially finished integrated circuit device including a barrier metal layer;

subjecting said barrier metal layer to a temperature greater than 200 degrees Celsius, while said barrier metal layer is subjected to a non-reactive atmosphere, for at least thirty seconds to form a pre-treated barrier metal layer; and

depositing a copper film on said pre-treated barrier metal layer.